A Review on Various Routing Protocol for Energy efficiency under WSN Scenario

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ABSTRACT

Wireless sensor nodes can be deployed on a battlefield and organize themselves in a large-scale ad-hoc network. Traditional routing protocols do not take into account that a node contains only a limited energy supply. Optimal routing tries to maximize the duration over which the sensing task can be performed, but requires future knowledge. As this is unrealistic, we derive a practical guideline based on the energy histogram and develop a spectrum of new techniques to enhance the routing in sensor networks. Our first approach aggregates packet streams in a robust way, resulting in energy reductions of a factor 2 to 3. Second, we argue that a more uniform resource utilization can be obtained by shaping the traffic flow. Several techniques, which rely only on localized metrics are proposed and evaluated. We show that they can increase the network lifetime up to an extra 90%beyond the gains of our first approach.

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I. INTRODUCTION:

The design of micro power wireless sensor systems has gained increasing importance for a variety of civil and military applications. With recent advances in MEMS technology and its associated interfaces, signal processing, and RF circuitry, the focus has shifted away from limited macro sensors communicating with base stations to creating wireless networks of communicating micro sensors that aggregate complex data to provide rich, multi-dimensional pictures of the environment. While individual micro sensor nodes are not as accurate as their macro sensor counterparts, the networking of a large number of nodes enables high quality sensing networks with the additional advantages of easy deployment and fault tolerance [8]. These characteristics that make micro sensors ideal for deployment in otherwise inaccessible environments where maintenance would be inconvenient or impossible.

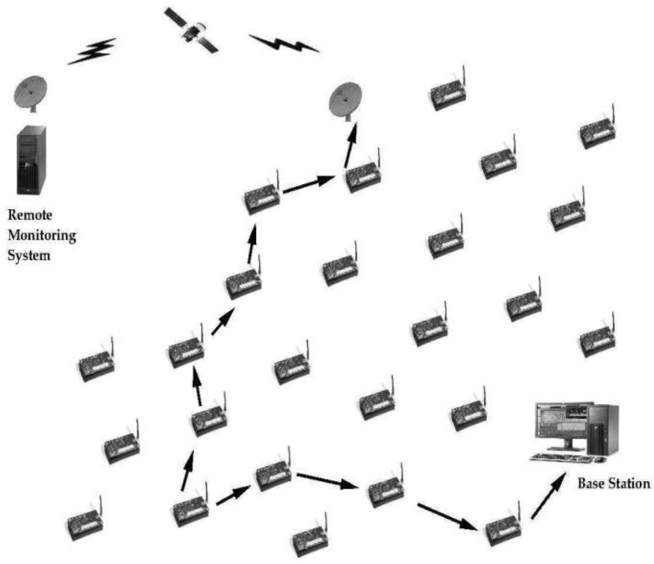

Figure 1.1: An example of wireless sensor network

The potential for collaborative, robust networks of micro sensors has attracted a great deal of research attention. The WINS and Pico Radio and projects, for instance, aim to integrate sensing, processing and radio communication onto a micro sensor node. Current prototypes are custom circuit boards with mostly commercial, off-the-shelf components. The Smart Dust project seeks a minimum-size solution to the distributed sensing problem, choosing optical communication on coin-sized "motes." The prospect of thousands of communicating nodes has sparked research into network protocols for information flow among micro sensors, such as directed diffusion. The unique operating environment and performance requirements of distributed micro sensor networks require fundamentally new approaches to system design [7]. As an example, consider the expected performance versus longevity of the micro sensor node, compared with current battery-powered portable devices

II. LITERATURE REVIEW

Wireless sensor networks gather data from places where it is difficult for humans to reach and once they are deployed, they work on their own and serve the data for which they are deployed [1].A wireless sensor network consists of sensor nodes deployed over a geographical area for monitoring physical phenomena like temperature, humidity, vibrations, seismic events, and so on. Typically, a sensor node is a tiny device that includes three basic components: a sensing subsystem for data acquisition from the physical surrounding environment, a processing subsystem for local data processing and storage, and a wireless communication subsystem for data transmission [2].

Minimizing energy dissipation and maximizing network lifetime are important issues in the design of protocols and applications for sensor networks. Energy-efficient sensor state planning consists in finding an optimal assignment of states to sensors in order to maximize network lifetime. For example, in area surveillance applications, only an optimal subset of sensors that fully covers the monitored area can be switched on while the other sensors are turned off. Typically, any sensor can be turned on, turned off, or promoted as a cluster head, and a different power consumption level is associated with each of these states [3].

Coverage is usually interpreted as how well a sensor network will monitor a field of interest. Typically we can monitor an entire area, watch a set of targets, or look for a breach among a barrier. Coverage of an entire area otherwise known as full or blanket coverage means that every single point within the field of interest is within a the sensing range of at least one sensor node [5].A sensor network deployment can usually be categorized as either a dense deployment or a sparse deployment. A dense deployment has a relatively high number of sensor nodes in the given field of interest while a sparse deployment would have fewer nodes. The dense deployment model is used in situations where it is very important for every event to be detected or when it is important to have multiple sensors cover an area. Sparse deployments may be used when the cost of the sensors make a dense deployment prohibitive or when we want to achieve maximum coverage using the bare minimum number of sensors [5].

III. PROPOSED METHODOLOGY

The most necessary constraint in or style challenge for wireless sensor network is energy potency. Sensor nodes are generally battery-powered through batteries that should be either replaced or recharged once depleted. Sensor nodes usually use the batteries for power provide within the wireless sensor networks. These sensor nodes are usually deployed or put in within the geographical area so as to watch the surroundings and to gather the knowledge from the geographical surroundings. Once the sensor nodes are deployed they are typically unapproachable to the operator. The vitalor the foremost Necessary point while using sensor nodes is that battery power ought to be consumed less so as to make wireless sensor network more energy economical or energy efficient. When these sensor nodes usually send the gather data or reports to the sink or base station they often consume the battery energy, due to which consumption of energy of the network will increases. Therefore energy conservation and energy economical or efficient routing protocol ought to be taken into consideration to develop the dynamic and adaptive idea within the networking for wireless sensor network. Designing an energy economical or efficient routing protocol that decrease the energy consumption of information transmissions and prolong the network life is a very important issue while creating wireless sensor network as energy economical or efficient. Our work will focus on study and comparison of different deployment techniques used in WSN, energy-optimal topology that maximizes network lifetime while ensuring simultaneously full area coverage and sensor connectivity to cluster heads, which are constrained to form a routing technique based on the topology.

IV. ENERGY-EFFICIENT NETWORKS

Once the power-aware micro sensor nodes are incorporated into the framework of a larger network, additional power-aware methodologies emerge at the network level. Decisions about local computation versus radio communication, the partitioning of computation across nodes, and error correction on the link layer offer a diversity of operational points for the network[8].

V. ENERGY EFFICIENT ROUTING

Ideally, we would like the sensor network to perform its functionality as long as possible. Optimal routing in energy constrained networks is not practically feasible (because it requires future knowledge). However, we can soften our requirements towards a statistically optimal scheme, which maximizes the network functionality considered over all possible future activity. A scheme is energy efficient (in contrast to 'energy optimal') when it is statistically optimal and causal (i.e. takes only past and present into account). In most practical surveillance or monitoring applications, we do not want any coverage gaps to develop. We therefore define the lifetime we want to maximize as the worst-case time until a node breaks down, instead of the average time over all scenarios. However, taking into account all possible future scenarios is too computationally intensive, even for simulation.

VI. CONCLUSION

In this paper we have argued that optimal routing in sensor networks is infeasible. We have proposed a practical guideline that advocates a uniform resource utilization, which can be visualized by the energy histogram. We acknowledge however that this is only a first cut attackling this complicated issue. While our spreading approaches aim at distributing the traffic in a more balanced way. To realize the ubiquitous computing in human life a sensor network may be the powerful tool, because they can be deployed at the places where a man cannot reach it is negative sides also because the power of sensor node cannot be refreshed. To realize the power control and power saving every layer take care of that. At Physical layer modulation schemes are chosen according to that the our basic ideas and techniques should be able to enhance other routing protocols as well.

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